Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of:	)	
	)	
Wireless E911 Location Accuracy Requirements	)	PS Docket No. 07-114
	)	
E911 Requirements for IP-Enhanced Service Providers	)	WC Docket No. 05-196
	)	

To: The Commission

COMMENTS OF WILSON ELECTRONICS, INC.

Wilson Electronics, Inc. ("Wilson"), by its attorney and pursuant to § 1.405(b) of the Commission's Rules ("Rules"), hereby submits its comments in response to the Commission's *Further Notice of Proposed Rulemaking*, FCC 10-177 (Sept. 23, 2010) ("*FNPRM*"), which solicited comments on a number of issues, including how wireless Enhanced 911 ("E911") caller location accuracy can be improved in challenging environments, such as in high-rise buildings, urban canyons, heavily forested or mountainous areas, or rural areas where wireless towers are "sparsely located."[1] Wilson submits that wireless E911 caller location accuracy can be improved — indeed the effectiveness of wireless E911 emergency calling systems can be improved — if the Commission strengthens its certification requirements for signal boosters to ensure that they can be used without causing interference to wireless networks. That is because signal boosters expand wireless network coverage and allow subscribers to complete E911 emergency calls to Public Safety Answering Points ("PSAPs") in challenging environments where wireless service would be otherwise unavailable.

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[1] *FNPRM* at 10 (¶ 22).

INTRODUCTION

Wilson is a leading manufacturer of cellular signal boosters.[2] Wilson's products operate in the frequency ranges of all major wireless systems in the United States and Canada and amplify transmissions for all mobile phones, as well as wireless modems used in laptops or other wireless devices.

Wilson signal boosters have been purchased by over 1,100 government entities, including police and fire departments, federal agencies, including the Department of Homeland Security and the FBI, the United States military, and state and local agencies — including E911 centers. Wilson signal boosters are used by businesses in every segment of the nation's economy, but particularly those that work in rural areas in such fields as energy exploration, transportation, power, and forestry. Wilson's business customers also include wireless service providers seeking to offer more reliable service and expanded coverage to their customers in rural America. And Wilson has sold cellular signal boosters to CMRS consumers who rely on the devices to ensure, extend and enhance their wireless service.

Wilson was one of the parties that prompted the ongoing proceeding in WT Docket No. 10-4 by asking the Commission to clarify and amend its rules regarding the use of signal boosters.[3] In particular, Wilson asked the Commission to launch a rulemaking to amend Part 20 of the Rules to establish standards for the certification of signal boosters for subscriber use on wireless networks.[4]

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[2] Wilson was founded in 1968 by James W. Wilson, a 40-year veteran of the wireless industry. Wilson began manufacturing cellular signal boosters in 2000. It is headquartered in St. George, Utah and currently employs approximately 250 people, including a dozen engineers.

[3] *See Wireless Telecommunications Bureau Seeks Comment on Petitions Regarding the Use of Signal Boosters and Other Signal Amplification Techniques Used with Wireless Services,* 25 FCC Rcd 68 (WTB 2010) ("*Signal Booster PN*").

[4] *See id.* at 69.

BACKGROUND

In the current signal booster proceeding in WT Docket 10-4, the Commission refers to a CMRS "signal booster" as including "all manner of amplifiers, repeaters, boosters, distributed antenna systems, and in-building radiation systems that serve to amplify CMRS device signals ... or extend the coverage of CMRS providers."[5] However, only three of the devices referred to as "signal boosters" are defined in the CMRS rules. Part 22 of the Rules defines a "signal booster" specifically as:

> A *stationary device* that automatically reradiates signals from base transmitters without channel translation, for the purpose of improving the reliability of existing service by increasing the signal strength in dead spots."[6]

Similarly, the Part 22 definition of the term "cellular repeater" is:

> A *stationary transmitter or device* that automatically re-radiates the transmissions of base transmitters at a particular cell site and mobile stations communicating with those base transmitters, with or without channel translation."[7]

Finally, the term "in-building radiation systems" is defined as:

> Supplementary system comprising low power transmitters, receivers, indoor antennas and/or leaky coaxial cable radiators, designed to improve service reliability inside buildings or structures located within the service areas of stations in the Public Mobile Services.[8]

Because in-building radiation systems are obviously stationary, it appears that the current CMRS rules on "signal boosters" apply to stationary devices that reradiate signals from base stations for the purpose of improving the reliability of wireless service by increasing the signal strength in dead spots or within buildings. Thus, signal boosters are used for the same purposes that wireless carriers are deploying what the Commission refers to as "emerging network

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[5] *Signal Booster PN,* 25 FCC Rcd at 68.

[6] 47 C.F.R. §22.99 (emphasis added).

[7] *Id.* (emphasis added).

[8] *Id.*

devices" that enhance coverage, such as femtocells, picocells, microcells, and distributed antenna systems.[9] The Commission recognizes that by increasing network coverage, these carrier-provided emerging network devices can be leveraged to enhance E911 location accuracy.[10]

If femtocell, picocells, microcells, and distributed antenna systems can be employed to transmit more accurate location information from challenging environments, so too can traditional stationary signal boosters. And the same is true for a signal booster that operates while in motion or as part of a "mobile station,"[11] which a cellular subscriber may operate under the authorization held by the subscriber's cellular service provider.[12] No Part 22 rule currently applies to mobile signal boosters that are widely used by cellular subscribers and by public safety agencies to improve service reliability. And the Commission has recognized in its signal booster proceeding that both traditional and mobile signal boosters "can help consumers, wireless service providers, and public safety first responders by expending the area of reliable service to unserved or weak signal areas."[13]

Led by CTIA-The Wireless Association® ("CTIA"), large cellular carriers have fought hard to have the Commission prohibit the use of signal boosters that currently compete with their own more-expensive signal amplification devices. While femtocell, picocells, microcells, and distributed antenna systems can extend reliable service to a subscriber home, a single floor of a building, or a specific neighborhood, they provide no help to a subscriber who is traveling within a dead spot simply because the subscriber's handset is out of range of network's nearest cell site.

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[9] *FNPRM* at 17 (¶ 40).

[10] *See id.* (¶ 41).

[11] The term "mobile station" is defined as "[o]ne or more transmitters that are capable of operation while in motion." 47 C.F.R. § 22.99.

[12] *See* 47 C.F.R. §§ 1.903(c) & 22.3(b).

[13] *Signal Booster PN*, 25 FCC Rcd at 68.

Only mobile signal boosters make reliable service available in such dead spots, many of which were of the cellular service provider's own making.

The transition from analog to digital wireless networks had a well-documented negative impact on the coverage of cellular networks.[14] Handset power limitation was the primary cause of the loss of coverage.[15] The analog phones had an output power of 3 Watts, whereas typical digital handsets operate at 0.2 Watts — a decrease of power of over 11 dB. Increasing the digital base station power levels, or employing high gain directional base station antennas, proved insufficient to restore the communication range to the analog levels due to handset power limitations, as the low power handset was unable to return the signal back to the base station. Subscribers in densely populated urban areas did not experience a loss of coverage due to the limited cell radius and the close proximity of cell sites in such areas. However, the coverage gaps did exist in the suburban and particularly in rural areas after the analog to digital transition.

When carriers first started transition to the first generation system (mostly TDMA), mobile units were dual mode, AMPS-TDMA. In rural areas, almost all cellular calls were initiated on the TDMA network and as the TDMA signal faded for any given cell, the handset automatically reverted to the analog system and carried the call until the TDMA network had strong enough signal to handle the call at which point the handset would switch to digital again. Creating these analog buffer zones between the digital coverage areas was how rural carriers maintained coverage.

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[14] *See Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies to Provide Spectrum-Based Services,* 19 FCC Rcd 19078, 19126-33 (2004). *See also Service Rules for the 698-746, 747-762 and 777-792 MHz Bands,* 22 FCC Rcd 8064, 8099-100 (2007).

[15] Engineers design wireless networks using link budgets, and the received signal levels are calculated mainly based on a balanced link budget and path loss. Once the handset power is decreased, it directly impacts the received signal levels and coverage shrinks.

As rural carriers started transitioning to second generation systems (GSM, CDMA) and third generation systems (UMTS/WCDMA, CDMA 2000), and with the analog systems completely removed, rural operators were forced to build out their networks to compensate for the loss of coverage due to handset power limitations. Subscriber demand for mobile signal boosters, which amplify the output power of digital handsets, resulted when carriers did not build out their networks either to fill in coverage gaps or to extend coverage. By creating weak signal areas or choosing not to expand coverage, cellular service providers are responsible for so-called challenging environments wherein subscribers need mobile signal boosters to place emergency calls to a PSAPs.

I. THE COMMISSION SHOULD REGULATE SIGNAL BOOSTERS SO THAT THE DEVICES CAN ENHANCE WIRELESS E911 LOCATION ACCURACY

In attempting to make the case for restricting subscriber use of signal boosters, CTIA actually demonstrated why consumers should have unfettered access to Commission-certificated, non-harmful signal boosters. CTIA correctly noted that the Commission has identified significant public safety-related functions that are performed by CMRS providers in connection with E911, Priority Access Service and Emergency Alert Service. With respect to E911, CTIA stated:

> The Commission has explained in its E911 proceedings that "[w]ireless phones can be a vital, life-saving way to call for assistance in emergency situations. Indeed, the ability to reach 911 in an emergency situation is one of the most important reasons Americans give for purchasing wireless phones." Further, the Commission has noted that "[w]hen carriers are incapable of transmitting such location information to the [PSAP], emergency response may be delayed and, in some cases, may be impossible until another source of location information is provided.[16]

CTIA did not address how wireless phones can be a life-saving way to call for assistance

[16] Petition for Declaratory Ruling of CTIA, WT Docket No. 10-4, at 4 (Nov. 2, 2007) (footnotes omitted)(quoting *Revisions of the Rules to Ensure Compatibility with E911 Emergency Calling Systems,* 14 FCC Rcd 17388, 17389 (1999) and *Wireless E911 Location Accuracy Requirements*, 22 FCC Rcd 10609, 10612 (2007)).

in emergency situations when they are within the cellular provider's CGSA but out of range of its cellular network. In those areas, unless the signals of cellular handsets are amplified, cellular subscribers will be unable to place E911 calls to PSAPs in emergency situations. That fact was tragically demonstrated on January 6, 2008, when nine people were killed and 43 injured in a bus accident near Mexican Hat in rural San Juan County, Utah.

The Mexican Hat accident involved a bus carrying 52 passengers returning from a ski trip to Telluride, Colorado. The bus careened off an embankment, overturned, and came to rest in a drainage ditch. During the rollover, the roof of the bus was torn off, and 50 of the passengers were ejected. The motorist who discovered the accident had to drive for 36 minutes before he could get cellular service and report the accident. It was only after the Mexican Hat tragedy that cellular repeaters were installed near the accident site.

The 36-minute delay in reporting the Mexican Hat accident prompted the National Transportation Safety Board ("NTSB") to warn of the risk of motorcoach travel in rural areas that lack the wireless coverage essential to make 911 calls from wireless handsets.[17] The NTSB announced that wireless coverage of the nation's highway system is necessary to "improve accident notification for emergency medical service response and coordination of prehospital transportation."[18] It warned that until coverage is "extended along highly traveled rural roads, motor carriers servicing rural areas without wireless telephone coverage remain at risk of being unable to report an accident or emergency in those locations."[19] Recognizing "the amount of time that will be required to develop the infrastructure necessary for wireless communications

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[17] NTSB Safety Recommendation, H-09-9, at 4 (May 29, 2009) ("NTSB Recommendation"). Attachment 1 hereto is a copy of the NTSB Recommendation.

[18] *Id.* at 4.

[19] *Id.*

along rural roads,"[20] the NTSB issued a recommendation to the American Bus Association and the United Motorcoach Association to advise their members "to carry mobile cellular amplifiers or satellite-based devices to communicate emergency events."[21] The NTSB named Wilson as a manufacturer of mobile amplifiers that "can be used to amplify weak cellular signals in rural areas."[22]

The use of mobile signal boosters can dramatically increase the coverage and effectiveness of wireless E911 emergency calling systems. Wilson has been conducting drive tests in five states to determine the extent to which the use of its Sleek signal booster expanded the reliable service area of cellular networks. Wilson has determined that the use of the Sleek booster will improve the existing wireless E911 coverage up to 50% or more depending on terrain, thereby vastly increasing the area within which cellular subscribers can place E911 calls for life-saving assistance in emergency situations.

Well-designed mobile signal boosters, such as those sold by Wilson, will improve E911 location accuracy particularly as summarized below.

- Mobile signal boosters can be used in all cellular environments (rural, suburban, metropolitan, mountainous terrain, in close proximity to a cell sites and at great

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[20] NTSB Recommendation at 4-5.

[21] *Id.* at 5.

[22] *Id.* at 5 n.7. The NTSB is far from the only governmental agency to recognize the significant public safety-related functions that are performed by cellular signal boosters. Rural and metropolitan police departments install signal boosters in their patrol cars to extend cellular coverage into remote areas, to improve the quality of voice and data communications, and to reduce the number of dropped calls. Increasingly, signal boosters are employed in patrol fleets to ensure officers have stable connections for their laptop computer systems to receive dispatch assignments, search records, and report emergencies. More than a year before the Mexican Hat tragedy prompted cellular operators to extend coverage to the accident site, the San Juan County sheriff's office and its search and rescue teams installed Wilson cellular amplifiers in their vehicles as a safety measure. Wilson signal boosters were recently installed in all the Nevada State Highway Patrol cars.

distances from them), because they dynamically sense their environment and adjust their characteristics appropriately.

- Because they simply extend handset range and improve signal quality, mobile signal boosters improve triangulation accuracy by allowing previous inaccessible cell sites to be accessed and included in triangulation calculations. This is extremely valuable in rural areas and other areas where cell site access is limited.

- Signal boosters improve location accuracy indoors by allowing deeper penetration of cell signals.

- Signal boosters equipped with GPS amplification features greatly improve GPS signal building penetration, thus improving the in-building location accuracy of handset-based technologies.

- GPS signal enhancement also allows elevation to be determined in many instances where it would have not been possible absent this feature.

If the ability to reach 911 in an emergency situation is one of the most important reasons consumers give for subscribing to cellular service, cellular subscribers should be afforded a *Carterfone* right to maximize the beneficial use of wireless E911 emergency calling systems by employing signal boosters that expand E911 coverage and improve location accuracy without causing interference with cellular networks.[23] After all, it is the cellular subscriber's life that may be at stake in an emergency situation. The subscriber deserves the private right to select the best life-saving cellular device for use in such a situation that will not cause public harm. Therefore, the Commission should regulate signal boosters in order to achieve dual regulatory goals, the first of which is to make affordable, non-interfering signal boosters available for subscribers to use in conjunction with emergency calling systems to enhance E911 location accuracy.

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[23] *See Carterfone*, 13 F.C.C. 2d 149, *reconsideration denied,* 14 F.C.C. 2d 571 (1968). The Commission has applied *Carterfone* principles to wireless service providers. *See Radio Telephone Industries, Inc. v. Mahaffey Message Relay, Inc.*, 61 F.C.C. 2d 212, 214 & n.9 (1976).

II. THE COMMISSION SHOULD PROHIBIT THE USE OF SIGNAL BOOSTERS THAT DEGRADE WIRELESS E911 EMERGENCY CALLING SYSTEMS

While acknowledging that signal boosters are extremely valuable to public safety networks, the National Emergency Number Administration ("NENA") and the Association of Public-Safety Communications Officials – International ("APCO") both urge the Commission to permit signal boosters to be operated only by a licensee or with licensee consent as a means to prevent signal boosters from causing interference to public safety networks and commercial wireless networks that are used for E911 calls.[24] Wilson certainly agrees that there are poorly-designed signal boosters currently in use that interfere with wireless networks primarily by oscillating and causing network overload. Hence, the Commission should act in furtherance of a second regulatory goal: to prohibit the use of signal boosters that interfere with network operations by oscillating and causing network overload. The Commission can best reach that goal by adopting certification standards that will ensure that certified signal boosters will not interfere with wireless networks.

The Commission's adoption of the dual goals advocated by Wilson will further the overriding interests of public safety that are served by this rulemaking. Permitting subscribers to use non-interfering signal boosters will expand the coverage of wireless E911 emergency calling systems and enhance their performance in emergencies; prohibiting the use of signal boosters that cause network interference will prevent such devices from disrupting the operation of emergency calling systems and degrading their performance. The Commission can easily distinguish the signal boosters that enhance the accuracy of the information that PSAPs receive

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[24] *See* Comments of NENA, WT Docket No. 10-4, at 2 ((Feb. 5, 2010); Comments of APCO, WT Docket No. 10-4, at 2 (Feb. 5, 2010). In a recent discussion with Wilson representatives, NENA officials came to a clearer understanding as to the interference issue which may lead NENA to change its initial position with regard to the use of signal boosters.

about the location of a wireless E911 caller from the boosters that can prevent PSAPs from receiving any information as to the caller's location by applying the technical standards proposed by Wilson in Docket No. 10-4 during the equipment certification process.

Respectfully submitted,

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January 19, 2011

ATTACHMENT 1

National Transportation Safety Board
Washington, D.C. 20594

Safety Recommendation

Date: May 29, 2009

In reply refer to: H-09-9

Mr. Peter J. Pantuso
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Mr. Victor Parra
Ex-Officio President and Chief Executive Officer
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The National Transportation Safety Board (NTSB) is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge your organizations to take action on the safety recommendation in this letter. The NTSB is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation addresses trip planning and motor carrier operation in rural areas lacking cellular telephone coverage. The recommendation is derived from the NTSB's investigation of the January 6, 2008, motorcoach rollover near Mexican Hat, Utah,[1] and is consistent with the evidence we found and the analysis we performed. As a result of this investigation, the NTSB has issued seven safety recommendations, one of which is addressed to both the American Bus Association (ABA) and the United Motorcoach Association (UMA). Information supporting the recommendations is discussed below. The NTSB would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendation.

On January 6, 2008, about 3:15 p.m. mountain standard time, a 2007 Motor Coach Industries 56-passenger motorcoach with a driver and 52 passengers on board departed Telluride, Colorado, en route to Phoenix, Arizona, as part of a 17-motorcoach charter. The motorcoach passengers were returning from a 3-day ski trip. The normal route from Telluride to Phoenix

[1] For more information, see *Motorcoach Rollover Near Mexican Hat, Utah, January 6, 2008*, Highway Accident Report NTSB/HAR-09/01 (Washington, DC: NTSB, 2009), which is available on the NTSB's website at <http://www.ntsb.gov/publictn/2009/HAR0901.pdf>.

along Colorado State Route 145 was closed due to snow, and the lead driver planned an alternate route that included U.S. Route 163/191 through Utah.

About 8:02 p.m., the motorcoach was traveling southbound, descending a 5.6-percent grade leading to a curve to the left, 1,800 feet north of milepost 29 on U.S. Route 163. The weather was cloudy, and the roadway was dry at the time of the accident. After entering the curve, the motorcoach departed the right side of the roadway at a shallow angle, striking the guardrail with the right-rear wheel and lower coach body about 61 feet before the end of the guardrail. The motorcoach traveled approximately 350 feet along the foreslope (portion of roadside sloping away from the roadway), with the right tires off the roadway. The back tires lost traction as the foreslope transitioned into the drainage ditch.

The motorcoach rotated in a counterclockwise direction as it descended an embankment. The motorcoach overturned, struck several rocks in a drainage ditch bed at the bottom of the embankment, and came to rest on its wheels. During the 360-degree rollover sequence, the roof of the motorcoach separated from the body, and 50 of the 53 occupants were ejected. As a result of this accident, 9 passengers were fatally injured, and 43 passengers and the driver received injuries ranging from minor to serious.

The National Transportation Safety Board determined that the probable cause of this accident was the driver's diminished alertness due to inadequate sleep resulting from a combination of head congestion, problems acclimating to high altitude, and his sporadic use of his continuous positive airway pressure sleeping device during the accident trip. The driver's state of fatigue affected his awareness of his vehicle's excessive speed and lane position on a downhill mountain grade of a rural secondary road. Contributing to the accident's severity was the lack of an adequate motorcoach occupant protection system, primarily due to the National Highway Traffic Safety Administration's delay in developing and promulgating standards to enhance the protection of motorcoach passengers.

Hours of Service

Arrow Stage Lines, the motor carrier involved in this accident, received a conditional rating during a postaccident compliance review conducted in February 2008.[2] One component of that less-than-satisfactory rating was based on violations of the hours-of-service regulations (49 *Code of Federal Regulations* Part 395). In addition to the accident driver, 16 other drivers associated with the Telluride trip had such violations: 14 had exceeded the 10-hour driving rule, 2 had falsified records, and 10 had exceeded the 15-hour work rule.

The lead driver communicated with Arrow management on the morning of the accident trip and, following that telephone call, made the decision to return to Phoenix along the alternate route. Hours-of-service regulations allow drivers to complete 10 hours of driving time under normal conditions. The regulations also provide consideration for adverse driving conditions,

[2] Arrow received two compliance reviews in the 2 years preceding the accident; in January 2006, Arrow received a satisfactory rating from the Federal Motor Carrier Safety Administration; in October 2007, Arrow received a rating of 1 (highest) from the U.S. Department of Defense contractor Consolidated Safety Services.

allowing for up to 12 hours of driving time, but only when those conditions are encountered en route, not if they are known prior to departure. The driving time exception would not have applied to the accident trip, which started on an alternate route because adverse weather had closed the preferred route, prompting drivers to begin the trip equipped with tire chains. The accident route was 556 miles, so travel time would have had to average better than 55 mph to not exceed the 10-hour hours-of-service rule. Considering the mountainous secondary roads, adverse weather conditions, and time required to remove tire chains, the average rate of travel should have been expected to be less than 55 mph, resulting in a trip time that would have exceeded 10 hours. The NTSB concludes that both Arrow Stage Lines and its drivers knew of the adverse weather conditions before starting the accident trip and thus intentionally engaged in a trip that would likely exceed hours-of-service regulations.

Until systemic monitoring capabilities are put in place, hours-of-service violations can be expected to continue. It has been the NTSB's position that the only way the Federal Motor Carrier Safety Administration (FMCSA) can effectively enforce carrier hours-of-service compliance is to mandate the use of electronic on-board recorders (EOBRs) by all operators.[3] Over 2 years ago, the FMCSA issued a notice of proposed rulemaking (NPRM)[4] requiring EOBRs for the most egregious hours-of-service violators; that NPRM has not yet been issued as a final rule. The Mexican Hat accident involves a carrier that would not likely be affected by the proposed EOBR rule; this accident again illustrates why the NTSB's past recommendation called for EOBRs for *all* commercial operators, not just problem carriers. The NTSB therefore reiterates its EOBR recommendation to the FMCSA:

> Require all interstate commercial vehicle carriers to use electronic on-board recorders that collect and maintain data concerning driver hours of service in a valid, accurate, and secure manner under all circumstances, including accident conditions, to enable the carriers and their regulators to monitor and assess hours-of-service compliance. (H-07-41)

Arrow Trip Scheduling

At the time of the accident, the driver had been driving for approximately 5 hours and was within the operational time constraints of the hours-of-service regulations. However, both Arrow and the drivers should have been aware that the scheduling of the longer return trip would be problematic. The trip route from Phoenix to Telluride was 486 miles, but the rerouted return trip was 556 miles, presenting the likelihood that contingency planning would be needed to avoid hours-of-service violations.[5]

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[3] As a result of its investigation of a 2004 accident involving a fatigued tractor-trailer driver, the NTSB recommended that EOBRs be required for all interstate commercial carriers (Safety Recommendation H-07-41). For further information, read *Rear-End Chain Reaction Collision, Interstate 94 East, Near Chelsea, Michigan, July 16, 2004*, Highway Accident Brief NTSB/HAB-07/01 (Washington, DC: NTSB, 2007).

[4] Notice of Proposed Rulemaking, "Electronic On-Board Recorders for Hours-of-Service Compliance," *Federal Register*, vol. 72, no. 11, pp. 2340–2394, January 18, 2007.

[5] FMCSA Regulation 392.6, *Schedules to Conform With Speed Limits*, provides the following guidance about trip length: Total trip distances of 550–600 miles on highways with a speed limit of 65 mph or of 450–500 miles on highways with a speed limit of 55 mph are considered "questionable," and motor carriers may be asked to document that such trips were made in compliance with the speed limit and hours-of-service limitations.

Arrow's options to avoid exceeding hours-of-service requirements included overnight accommodations for the more than 800 passengers and drivers, either in Telluride or along the return route to Phoenix,[6] or the provision of relief drivers along the route for the 17 motorcoaches. Either option would have required substantial coordination, both in terms of the logistics to arrange either hotel accommodations or additional drivers and with the charter passengers who expected to return to regular activities on Monday following the weekend trip. Arrow could not reasonably expect the drivers to handle contingency plan arrangements for rescheduling the charter trip to avoid exceeding hours-of-service regulations. The NTSB therefore concludes that Arrow Stage Lines should have developed contingency plans to avoid hours-of-service violations associated with the return trip.

For contingency plans to be effective, they must be considered before the start of the trip, documented, and coordinated with the charter group. As a result of this accident investigation, the NTSB is recommending that Arrow Stage Lines develop written contingency plans for each charter to ensure that trip planning is in place in the event of driver fatigue, incapacitation, or illness or in the event of trip delays necessitating replacement drivers to avoid hours-of-service violations and inform drivers of their trip's contingency plans. Such plans could include but not be limited to: identifying alternate drivers and equipment and checking on their availability, identifying suitable relief positions to swap drivers or equipment, planning rerouting options around road closures or weather, and identifying overnight accommodations that could be contacted in the event that a trip needs to be delayed. Moreover, the NTSB recommends that the ABA and the UMA inform their members through Web sites, newsletters, and conferences of the circumstances of the Mexican Hat, Utah, accident and encourage charter operators to develop written contingency plans for each charter to ensure that trip planning is in place in the event of driver fatigue, incapacitation, or illness or in the event of trip delays necessitating replacement drivers to avoid hours-of-service violations and inform drivers of their trip's contingency plans.

Emergency Notification

Another issue examined by this accident investigation is the risk of motorcoach travel in rural areas. Due to the lack of wireless telephone coverage at the accident scene, it took 36 minutes to report the Mexican Hat accident. Parts of San Juan County, like many rural areas, do not have wireless telephone coverage, and, in those areas, it is still not possible to make 911 calls from wireless devices.

Since the accident, three cellular antenna/repeaters have been installed near the accident site, but more work is needed at the national level. A pervasive wireless capability throughout our nation's highway system will undoubtedly improve highway accident notification for emergency medical service response and coordination of prehospital transport. The NTSB concludes that until wireless capability is extended along highly traveled rural roads, motor carriers servicing rural areas without wireless telephone coverage remain at risk of being unable to report an accident or emergency in those locations. The NTSB recognizes the amount of time that will be required to develop the infrastructure necessary for wireless communication along

[6] Arrow could have delayed the trip departure until the shorter route through Lizard Head Pass was reopened, though it is unlikely that room accommodations in the resort town would have been available. For such a large group, accommodations all along the return route would have been necessary.

rural roads. In the interim, the NTSB recommends that the ABA and the UMA inform their members through Web sites, newsletters, and conferences about the risks of operating in rural areas without wireless telephone coverage and advise members to carry mobile cellular amplifiers[7] or satellite-based devices[8] to communicate emergency events.

As a result of its investigation, the National Transportation Safety Board makes the following recommendation to the American Bus Association and the United Motorcoach Association:

> Inform your members through Web sites, newsletters, and conferences of the circumstances of the Mexican Hat, Utah, accident. The prepared information should encourage charter operators to develop written contingency plans for each charter to ensure that trip planning is in place in the event of driver fatigue, incapacitation, or illness or in the event of trip delays necessitating replacement drivers to avoid hours-of-service violations and inform drivers of their trip's contingency plans. The prepared information should also provide information about the risks of operating in rural areas without wireless telephone coverage and advise members to carry mobile cellular amplifiers or satellite-based devices to communicate emergency events. (H-09-9)

The NTSB also issued recommendations to the Federal Interagency Committee on Emergency Medical Services, the Utah Bureau of Emergency Medical Services, the Federal Highway Administration, the American Association of State Highway and Transportation Officials, the National Association of State Emergency Medical Services Officials, and Arrow Stage Lines and reiterated one previously issued recommendation to the FMCSA.

In response to the recommendation in this letter, please refer to Safety Recommendation H-09-9. If you would like to submit your response electronically rather than in hard copy, you may send it to the following e-mail address: correspondence@ntsb.gov. If your response includes attachments that exceed 5 megabytes, please e-mail us asking for instructions on how to use our Tumbleweed secure mailbox. To avoid confusion, please use only one method of submission (that is, do not submit both an electronic copy and a hard copy of the same response letter).

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[7] Electronics designed specifically for mobile applications can be used to amplify weak cellular signals in rural areas. For example, Wilson Electronics in St. George, Utah, sells a mini-mobile amplifier kit that is comparable in cost to a global positioning system unit.

[8] Transport companies often make use of satellite-based mobile resource management systems. In addition to satellite phones, satellite personal trackers are available (for example SPOT Portable ELT) that provide real-time location tracking using Google Earth with one-way text messaging.

Acting Chairman ROSENKER and Members HERSMAN, HIGGINS, and SUMWALT concurred in this recommendation. Member HIGGINS filed a concurring statement, which is attached to the highway accident report.

[Original Signed]

By: Mark V. Rosenker
Acting Chairman